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(b) a nucleotide sequence encoding a polypeptide as set forth in SEQ ID NO: 5 with at least one amino acid insertion, wherein the encoded polypeptide has an activity of the polypeptide set forth in SEQ ID NO: 5;

(c) a nucleotide sequence encoding a polypeptide as set forth in SEQ ID NO: 5 with at least one amino acid deletion, wherein the encoded polypeptide has an activity of the polypeptide set forth in SEQ ID NO: 5;

(d) a nucleotide sequence encoding a polypeptide as set forth in SEQ ID NO: 5 which has a C- and/or N- terminal truncation, wherein the encoded polypeptide has an activity of the polypeptide set forth in SEQ ID NO: 5;

(e) a nucleotide sequence encoding a polypeptide as set forth in SEQ ID NO: 5 with at least one modification that is a conservative amino acid substitution, an amino acid insertion, an amino acid deletion, C-terminal truncation, or N-terminal truncation, wherein the encoded polypeptide has an activity of the polypeptide set forth in SEQ ID NO: 5;

(f) a nucleotide sequence of any of (a) - (e) comprising a fragment of at least about 16 nucleotides;

(g) a nucleotide sequence which hybridizes under at least moderately stringent conditions to the complement of the nucleotide sequence of any of (a) - (f); and

(h) a nucleotide sequence complementary to the nucleotide sequence of any of (a) - (e).

REMARKS

The Examiner indicated that claims 1-8, 10, 11, and 43-45 were pending at the issuance of the instant Office Action. Claims 1-3 have been amended to recite only the species elected by telephone on August 13, 2001 and more clearly recite the claimed invention. The amendments to the claims are fully supported by the specification. No new matter has been added as a result of the above-described amendments. The rejections set forth in the Office Action have been overcome by amendment or are traversed by argument below.

1. Objection to the specification

The Office Action contains an objection to the specification as lacking the priority data. Applicants have amended the specification to recite the priority data.

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2. Rejections of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 101

The Office Action asserts a rejection of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 101. The Examiner takes the position that the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility. Applicants traverse this rejection.

Applicants contend that the instant application contains an assertion of a specific and substantial utility for the claimed invention that would be credible to one of ordinary skill in the art. The instant application teaches rat IFN-L nucleotide sequences that share amino acid sequence homology with members of the interferon family of proteins (page 93, lines 15-18). The instant application also teaches human IFN-L nucleotide sequences that share the characteristic intronless structure of the interferon gene family (page 93, lines 23-27). Sequence analysis strongly indicated that the human and rat IFN-L polypeptides are secreted cytokines (page 95, lines 14-16) and that both share conserved cysteine residues with IFN-β (Figure 3). Nearly all of the related amino acid sequences identified in a BLAST search using the human IFN-L amino acid sequence (SEQ ID NO: 5) are members of the interferon family of proteins (Exhibit A). Based on the expression of human IFN-L mRNA in the pancreas, small intestine, prostrate, uterus, thyroid, and placenta, described *inter alia*, at page 96, lines 6-8 of the specification, and the teaching of the instant specification that human IFN-L polypeptide has a phosphorylation activity (Example 5), one of ordinary skill in the art would recognize that the claimed molecules could be useful, for example, in modulating polypeptide phosphorylation in the pancreas, small intestine, prostrate, uterus, thyroid, and placenta.

Exhibits B and C illustrate that the instantly-claimed human IFN-L polypeptide shares substantial amino acid sequence identity with the interferon molecules disclosed by Cao *et al.* (GenBank Accession No. AF146759, published May 4, 2000) and the NCBI Annotation Project (GenBank Accession No. XM_035950, first published October16, 2001). Exhibit D illustrates that the instantly-claimed human IFN-L polypeptide shares substantial amino acid sequence identity with the interferon kappa polypeptide disclosed by LaFleur *et al.* (GenBank Accession No. AF384047, published October 23, 2001), which is selectively expressed in epidermal keratinocytes (LaFleur *et al.*, 2001, *J. Biol. Chem.* 276:39765-71). Applicants contend that based on the totality of the evidence of record, one of ordinary skill in the art would recognize that IFN-L is a member of the

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interferon family of proteins. In fact, the references cited above indicate that those of ordinary skill in the art, absent Applicants' teaching, *have* recognized that the polypeptide set forth in SEQ ID NO: 5 *is* a member of the interferon family of proteins, albeit subsequent to Applicants' identification of this member of the interferon family (indeed, after Applicants' priority filing date of December 8, 1999). Moreover, as interferons have substantial real world use, Applicants contend that one or ordinary skill in the art would recognize that the claimed molecules have credible, specific, and substantial utility.

Applicants contend that because the instant application contains an assertion of a specific and substantial utility for the claimed invention credible to one of ordinary skill in the art, the rejection under 35 U.S.C. § 101 should be withdrawn.

3. Rejections of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 112, first paragraph

The Office Action asserts a rejection of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 112, first paragraph. The Examiner takes the position that because the claimed invention is not supported by either a specific or substantial asserted utility or a well-established utility, one skilled in the art would not know how to use the claimed invention. Applicants have set forth affirmative evidence that the asserted utility would be credible to one of ordinary skill in the art. Applicants contend that because the instant application contains an assertion of a specific and substantial utility for the claimed invention that one of ordinary skill in the art would find to be credible, this rejection should be withdrawn.

The Office Action also asserts a rejection of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 112, first paragraph, as not being enabling for variants, sequences identified by hybridization, and fragments of the nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 4. Based on the expression of human IFN-L mRNA in the pancreas, small intestine, prostrate, uterus, thyroid, and placenta, and the teaching of the instant specification that human IFN-L polypeptide has a phosphorylation activity, Applicants contend that one of ordinary skill in the art would know how to make and use the claimed sequences or their variants or fragments. Applicants further contend that based on their recitation of a functional feature common to the claimed sequences or their variants or fragments (phosphorylation), and coupled with the teachings in the instant specification regarding

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the preparation of IFN-L variants having conservative amino acid substitutions (page 23, lines 2-12) and examples of appropriate hybridization conditions for identifying IFN-L variants (*e.g.*, page 17, lines 7-10; page 18, lines 11-13), the identification of IFN-L variants or IFN-L fragments having an activity of the polypeptide set forth in SEQ ID NO: 5 would not require undue experimentation. Therefore, Applicants respectfully request that this rejection be withdrawn.

The Office Action also asserts a rejection of claims 1, 2, 4-8, 10, 11, and 43-45 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Examiner takes the position that Applicants' referral to the deposit of PTA-976 in the specification and claims 1 and 2 is an insufficient assurance that all of the conditions of 37 C.F.R. §§ 1.801-1.809 have been met. The Examiner further takes the position that the specification must be amended to recite the date of deposit, the complete name and address of the depository, and the accession number of the deposited biological material. Applicants respectfully direct the Examiner's attention to page 92, lines 25-28 of the specification where Applicants disclose that a deposit of cDNA encoding human IFN-L polypeptide, subcloned into pSPORT1 (Gibco BRL) and transformed into *E. coli* strain DH10B, was made with the American Type Culture Collection (ATCC), 10801 University Boulevard, Manassas, VA 20110-2209, before the filing date of the instant application. Pursuant to the Examiner's request, Applicants also submit herewith a Declaration stating that deposits complying with 37 C.F.R. §§ 1.801-1.809 were made under the provisions of the Budapest Treaty. Applicants contend that all the requirements of 37 C.F.R. §§ 1.801-1.809 have been met. *In re Lundak,* 225 U.S.P.Q. 90 (Fed. Cir. 1985). Withdrawal of this rejection is therefore respectfully solicited.

The Office Action also asserts a rejection of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner takes the position that the disclosure of two nucleic acid sequences does not adequately describe the scope of the claimed genus, which encompasses a substantial variety of subgenera. The Examiner notes that a description of a genus of cDNAs may be achieved by means of a recitation of a representative number of

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cDNAs, defined by nucleotide sequence, falling within the scope of the genus *or* a recitation of structural *or* functional features common to the members of the genus.

Applicants recite at least one functional feature – phosphorylation activity – common to the members of each genus of claimed IFN-L polypeptide variants. The instant application teaches the nucleotide sequences and corresponding amino acid sequences for rat and human IFN-L polypeptide. The instant application also teaches that conservative amino acid substitutions may be made in those portions of the IFN-L polypeptide that are not conserved among IFN-L orthologs (page 23, lines 2-12). Applicants therefore contend that a sufficient description of the genus of IFN-L nucleic acid molecules encoding a polypeptide having at least one conservative substitution and possessing an activity of the polypeptide set forth in SEQ ID NO: 5 has been provided. Applicants further contend that because the instant application teaches at least one functional feature common to the members of the genus of IFN-L polypeptide variants that are C- and/or N- terminal truncated and possess an activity of the polypeptide set forth in SEQ ID NO: 5, a sufficient description of that genus has been provided. Withdrawal of this rejection is therefore respectfully solicited.

4. Rejections of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 112, second paragraph

The Office Action asserts a rejection of claims 1-8, 10, 11, and 43-45 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner takes the position that claims 1-8, 10, 11, and 43-45 are indefinite because they encompass molecules identified by hybridization and hybridization conditions are not defined in the specification. Applicants note that the specification defines the meaning of the terms "moderately stringent conditions" (page 18, lines 8-14) and "highly stringent conditions" (page 17, lines 3-10), and provides examples of each. Therefore, Applicants contend that the claims are not indefinite for reciting the phrase "moderately stringent conditions," and respectfully request withdrawal of this rejection.

The Examiner also takes the position that claims 2-8, 10, 11, and 46-48 are indefinite for reciting "an activity of the polypeptide." Applicants contend that claims containing this limitation encompass only those nucleic acid molecules encoding IFN-L polypeptide variants that possess an inherent activity (phosphorylation) of the polypeptide set forth in SEQ ID NO: 5. Applicants teach

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the expression of human IFN-L mRNA in the pancreas, small intestine, prostrate, uterus, thyroid, and placenta. The expression of IFN-L polypeptides in these tissues indicates that IFN-L polypeptide has an inherent function. Moreover, Applicants teach that IFN-L polypeptide has a phosphorylation activity. In view of the inherency of activity that resides in polypeptides having the amino acid sequence as set forth in SEQ ID NO. 5, and teachings in the instant specification that IFN-L has a phosphorylation activity, Applicants respectfully contend that the term is not indefinite and that the claims fulfills the requirements of 35 U.S.C. § 112, second paragraph.

CONCLUSIONS

Applicants respectfully contend that all conditions of patentability are met in the pending claims as amended. Allowance of the claims is thereby respectfully solicited.

If Examiner Andres believes it to be helpful, she is invited to contact the undersigned representative by telephone at (312) 913-0001.

Respectfully submitted,
McDonnell Boehnen Hulbert & Berghoff

Dated: February 25, 2002

By: _____
Donald L. Zuhn, Ph.D.
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AMENDMENTS TO THE CLAIMS

Marked Up Versions of Amended Claims under 37 C.F.R. 1.121(c)(1)(ii)

1. (Amended) An isolated nucleic acid molecule comprising ~~a nucleotide sequence selected from the group consisting of~~:

(a) the nucleotide sequence as set forth in ~~either SEQ ID NO: 1 or~~ SEQ ID NO: 4;

(b) the nucleotide sequence of the DNA insert in ATCC Deposit No. PTA-976;

(c) a nucleotide sequence encoding the polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(d) a nucleotide sequence which hybridizes under at least moderately ~~or highly stringent~~ conditions to the complement of the nucleotide sequence of any of (a) - (c); ~~and~~or

(e) a nucleotide sequence complementary to the nucleotide sequence of any of (a) - (c).

2. (Amended) An isolated nucleic acid molecule comprising ~~a nucleotide sequence selected from the group consisting of~~:

(a) a nucleotide sequence encoding a polypeptide which is at least about 70 percent identical to the polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5, wherein the encoded polypeptide has an activity of the polypeptide set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(b) a nucleotide sequence encoding an allelic variant ~~or splice variant~~ of the nucleotide sequence as set forth in ~~either SEQ ID NO: 1 or~~ SEQ ID NO: 4, the nucleotide sequence of the DNA insert in ATCC Deposit No. PTA-976, or the nucleotide sequence of (a);

(c) a region of the nucleotide sequence of ~~either SEQ ID NO: 1 or~~ SEQ ID NO: 4, the DNA insert in ATCC Deposit No. PTA-976, or the nucleotide sequence of (a)~~,~~ or (b) encoding a polypeptide fragment of at least about 25 amino acid residues, wherein the polypeptide fragment has an activity of the encoded polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5, or is antigenic;

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(d) a region of the nucleotide sequence of ~~either SEQ ID NO: 1 or~~ SEQ ID NO: 4, the nucleotide sequence of the DNA insert in ATCC Deposit No. PTA-976, or the nucleotide sequence of any of (a) - (c) comprising a fragment of at least about 16 nucleotides;

(e) a nucleotide sequence which hybridizes under at least moderately ~~or highly~~ stringent conditions to the complement of the nucleotide sequence of any of (a) - (d); ~~and~~or

(f) a nucleotide sequence complementary to the nucleotide sequence of any of (a) - (d).

3. (Amended) An isolated nucleic acid molecule comprising ~~a nucleotide sequence selected from the group consisting of~~:

(a) a nucleotide sequence encoding a polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5 with at least one conservative amino acid substitution, wherein the encoded polypeptide has an activity of the polypeptide set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(b) a nucleotide sequence encoding a polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5 with at least one amino acid insertion, wherein the encoded polypeptide has an activity of the polypeptide set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(c) a nucleotide sequence encoding a polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5 with at least one amino acid deletion, wherein the encoded polypeptide has an activity of the polypeptide set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(d) a nucleotide sequence encoding a polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5 which has a C- and/or N- terminal truncation, wherein the encoded polypeptide has an activity of the polypeptide set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(e) a nucleotide sequence encoding a polypeptide as set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5 with at least one modification ~~selected from the group consisting of~~that is a conservative amino acid substitutions, an amino acid insertions, an amino acid deletions, C-terminal truncation, ~~and~~or N-terminal truncation, wherein the encoded polypeptide has an activity of the polypeptide set forth in ~~either SEQ ID NO: 2 or~~ SEQ ID NO: 5;

(f) a nucleotide sequence of any of (a) - (e) comprising a fragment of at least about 16 nucleotides;

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(g) a nucleotide sequence which hybridizes under at least moderately ~~or highly~~ stringent conditions to the complement of the nucleotide sequence of any of (a) - (f); and

(h) a nucleotide sequence complementary to the nucleotide sequence of any of (a) - (e).

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EXHIBIT A

Sequences producing significant alignments:	Score (bits)	E Value
gi|14738106|ref|XP_035950.1| (XM_035950) interferon-like pr...	346	1e-94
gi|7688655|gb|AAF67468.1|AF146759_1 (AF146759) interferon-l...	344	2e-94
gi|14488026|gb|AAK63834.1|AF384047_1 (AF384047) interferon ...	290	6e-78
gi|10180639|gb|AAG14168.1| (AF238611) interferon tau [Bos t...	90	1e-17
gi|6707758|sp|P15696|INT1_BOVIN INTERFERON TAU-1 PRECURSOR ...	87	9e-17
gi|136022|sp|P15695|TP12_BOVIN TROPHOBLAST PROTEIN-1 PRECUR...	86	2e-16
gi|163765|gb|AAA50457.1| (M31556) trophoblast protein-1 [Bo...	86	2e-16
gi|108956|pir||S23751 trophoblast interferon type I precurs...	86	2e-16
gi|108954|pir||A39505 trophoblast interferon 4 precursor (c...	86	3e-16
gi|6446549|gb|AAF08677.1|AF196326_1 (AF196326) interferon-t...	85	4e-16
gi|108953|pir||B39505 trophoblast protein-1 precursor (clon...	85	4e-16
gi|625506|pir||A61403 interferon alpha-II-10 precursor - sheep	85	5e-16
gi|108955|pir||A40068 trophoblast protein-1 precursor (clon...	85	5e-16
gi|6707696|sp|P56831|INT3_BOVIN INTERFERON TAU-3 (IFN-TAU3)...	85	5e-16
gi|6446547|gb|AAF08676.1|AF196325_1 (AF196325) interferon-t...	85	5e-16
gi|627779|pir||A61578 trophoblast protein 1 (clone SPW49) -...	85	6e-16
gi|6446551|gb|AAF08678.1|AF196327_1 (AF196327) interferon-t...	84	6e-16
gi|6707700|sp|Q08071|INT7_SHEEP INTERFERON TAU-7 PRECURSOR ...	84	8e-16
gi|14140244|ref|NP_114482.1| (NM_032093) pregnancy-associat...	84	8e-16
gi|6513855|gb|AAF08671.2|AF196320_1 (AF196320) interferon-t...	84	1e-15
gi|124498|sp|P07352|INO1_BOVIN Interferon omega-1 precursor...	84	1e-15
gi|8347785|gb|AAF74783.1|AF270471_1 (AF270471) interferon-t...	84	1e-15
gi|2136874|pir||I46397 interferon alpha - sheep >gi|416542|...	83	2e-15
gi|6707689|sp|O46633|INT_CEREL INTERFERON TAU PRECURSOR (IF...	83	2e-15
gi|6707704|sp|Q29429|INT6_SHEEP Interferon tau-6 precursor ...	83	2e-15
gi|6707703|sp|Q28595|INT5_SHEEP INTERFERON TAU-5 PRECURSOR ...	83	2e-15
gi|6446543|gb|AAF08674.1|AF196323_1 (AF196323) interferon-t...	83	2e-15
gi|6707695|sp|P56830|INT2_BOVIN INTERFERON TAU-2 (IFN-TAU2)...	82	2e-15
gi|6707702|sp|Q28594|INT4_SHEEP INTERFERON TAU-4 PRECURSOR ...	82	3e-15
gi|2118659|pir||I47070 interferon omega - sheep >gi|165829|...	82	3e-15
gi|6446541|gb|AAF08673.1|AF196322_1 (AF196322) interferon-t...	82	3e-15
gi|6707755|sp|P56828|INT1_SHEEP INTERFERON TAU-1 PRECURSOR ...	82	3e-15
gi|6707759|sp|P56829|INT2_SHEEP INTERFERON TAU-2 PRECURSOR ...	82	3e-15
gi|4504605|ref|NP_002168.1| (NM_002177) interferon, omega 1...	82	4e-15
gi|89874|pir||JS0204 trophoblast interferon alpha precursor...	82	4e-15
gi|6707692|sp|P28172|INT_OVIMO INTERFERON TAU PRECURSOR (IF...	82	4e-15
gi|5532999|gb|AAD44974.1|AF158822_1 (AF158822) interferon-t...	82	5e-15
gi|5532997|gb|AAD44973.1|AF158821_1 (AF158821) interferon-t...	82	5e-15
gi|6707699|sp|Q08070|INT9_SHEEP INTERFERON TAU-9 PRECURSOR ...	82	5e-15
gi|5533001|gb|AAD44975.1|AF158823_1 (AF158823) interferon-t...	81	6e-15
gi|6707701|sp|Q08072|INT8_SHEEP INTERFERON TAU-8 PRECURSOR ...	81	6e-15
gi|5107464|pdb|1B5L| Ovine Interferon Tau	81	7e-15
gi|5532991|gb|AAD44970.1|AF158818_1 (AF158818) interferon-t...	81	7e-15
gi|5532995|gb|AAD44972.1|AF158820_1 (AF158820) interferon-t...	81	7e-15
gi|6707697|sp|P56832|INT3_SHEEP INTERFERON TAU-3 (IFN-TAU3)...	80	1e-14
gi|1708490|sp|P49876|INAF_BOVIN INTERFERON ALPHA-F PRECURSO...	80	2e-14
gi|124430|sp|P07348|INA1_BOVIN INTERFERON ALPHA-1 PRECURSOR...	80	2e-14
gi|108329|pir||S23711 interferon alpha-II-5 precursor - pig...	79	2e-14
gi|758083|emb|CAA26501.1| (X02669) human interferon omega p...	79	2e-14
gi|386800|gb|AAA52724.1| (M11003) interferon-alpha [Homo sa...	79	4e-14
gi|6707694|sp|P28169|INTB_SHEEP INTERFERON TAU-11 PRECURSOR...	78	5e-14
gi|847816|gb|AAA70091.1| (U25670) interferon omega-1 [Homo ...	78	7e-14
gi|478668|pir||S23710 interferon alpha-II-4 precursor - pig...	77	7e-14
gi|10180643|gb|AAG14170.1| (AF238613) interferon tau [Bos t...	77	8e-14
gi|5532993|gb|AAD44971.1|AF158819_1 (AF158819) interferon-t...	77	8e-14
gi|124450|sp|P05008|INAB_BOVIN INTERFERON ALPHA-B PRECURSOR...	77	9e-14
gi|6707691|sp|P28171|INT_CAPHI INTERFERON TAU PRECURSOR (IF...	77	9e-14
gi|6707698|sp|Q08053|INTA_SHEEP INTERFERON TAU-10 PRECURSOR...	77	9e-14

gi|124454|sp|P05010|INAD_BOVIN INTERFERON ALPHA-D PRECURSOR...	77	1e-13
gi|2118657|pir||I47098 trophoblast protein-1 - sheep >gi|16...	77	1e-13
gi|4504603|ref|NP_002167.1| (NM_002176) interferon, beta 1,...	77	1e-13
gi|6707693|sp|Q95187|INT_GIRCA INTERFERON TAU PRECURSOR (IF...	76	2e-13
gi|13640606|ref|XP_005506.3| (XM_005506) interferon, alpha ...	75	3e-13
gi|1708492|sp|P49878|INAH_BOVIN INTERFERON ALPHA-H PRECURSO...	75	4e-13
gi|124434|sp|P05004|INA2_HORSE INTERFERON ALPHA-2 PRECURSOR...	75	4e-13
gi|69659|pir||IVHUA9 interferon alpha-17 precursor - human ...	75	5e-13
gi|1708491|sp|P49877|INAG_BOVIN INTERFERON ALPHA-G PRECURSO...	74	6e-13
gi|10880985|ref|NP_067091.1| (NM_021268) interferon, alpha ...	74	7e-13
gi|3766295|emb|CAA09862.1| (AJ011909) interferon beta [Maca...	74	7e-13
gi|4504591|ref|NP_002163.1| (NM_002172) interferon, alpha 1...	74	7e-13
gi|124499|sp|P05001|INO1_HORSE INTERFERON OMEGA-1 PRECURSOR...	74	8e-13
gi|2118648|pir||I37584 IFN-alpha-N-protein - human >gi|3272...	74	9e-13
gi|17451041|ref|XP_071048.1| (XM_071048) similar to interfe...	74	9e-13
gi|7558588|gb|AAC60525.2| (S68999) interferon-omega48; IFN-...	74	1e-12
gi|124452|sp|P05009|INAC_BOVIN INTERFERON ALPHA-C PRECURSOR...	73	2e-12
gi|124447|sp|P05007|INAA_BOVIN INTERFERON ALPHA-A PRECURSOR...	73	2e-12
gi|2118660|pir||I51970 interferon precursor - human >gi|186...	72	2e-12
gi|124431|sp|P05003|INA1_HORSE INTERFERON ALPHA-1 PRECURSOR...	72	3e-12
gi|2118661|pir||I56314 interferon-alpha - human (fragment) ...	72	3e-12
gi|124437|sp|P05006|INA4_HORSE INTERFERON ALPHA-4 PRECURSOR...	72	3e-12
gi|124436|sp|P05005|INA3_HORSE INTERFERON ALPHA-3 PRECURSOR...	72	3e-12
gi|2147610|pir||I46972 interferon-omega44 - rabbit >gi|5451...	72	4e-12
gi|4504593|ref|NP_002164.1| (NM_002173) interferon, alpha 1...	72	4e-12
gi|2136876|pir||S70011 interferon type I precursor - sheep ...	72	5e-12
gi|108328|pir||S23712 interferon alpha-II-3 precursor - pig...	71	6e-12
gi|1708489|sp|P49879|INA1_PIG INTERFERON ALPHA-1 PRECURSOR ...	71	7e-12
gi|2136875|pir||I46398 interferon alpha - sheep >gi|1197|em...	71	7e-12
gi|184623|gb|AAC41702.1| (M25460) interferon-beta [Homo sap...	71	8e-12
gi|2147611|pir||I46974 interferon-omega45 - rabbit >gi|5451...	71	9e-12
gi|14715255|emb|CAC44125.1| (AJ250196) interferon-alpha [Sa...	70	1e-11
gi|1679798|gb|AAB19230.1| (U77908) interferon alpha [Odocoi...	70	1e-11
gi|5381301|gb|AAD42931.1| (AF085804) IFN-alpha 21a/IFN-alph...	70	1e-11
gi|2147609|pir||I46975 interferon-omega20 - rabbit >gi|5451...	70	1e-11
gi|4504589|ref|NP_002162.1| (NM_002171) interferon, alpha 1...	70	1e-11
gi|14715253|emb|CAC44124.1| (AJ250195) interferon-alpha [Sa...	70	1e-11
gi|124502|sp|P05002|INO2_HORSE INTERFERON OMEGA-2 PRECURSOR...	70	2e-11
gi|6754296|ref|NP_034635.1| (NM_010505) interferon alpha fa...	70	2e-11
gi|17451073|ref|XP_027565.2| (XM_027565) similar to interfe...	70	2e-11
gi|12734754|ref|XP_011766.1| (XM_011766) interferon, alpha ...	70	2e-11
gi|6754290|ref|NP_034632.1| (NM_010502) interferon alpha fa...	69	2e-11

EXHIBIT B

```
                10         20         30         40         50         60
              *   *      *   *      *   *      *   *      *   *      *   *
AF146759  MSTKPDMIQK CLWLEILMGI FIAGTLSLDC NLLNVHLRRV TWQNLRHLSS MSNSFPVECL>
          |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L     MSTKPDMIQK CLWLEILMGI FIAGTLSLDC NLLNVHLRRV TWQNLRHLSS MSNSFPVECL

                70         80         90        100        110        120
              *   *      *   *      *   *      *   *      *   *      *   *
AF146759  RENIAFELPQ EFLQYTQPMK RDIKKAFYEM SLQAFNIFSQ HTFKYWKERH LKQIQIGLDQ>
          |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L     RENIAFELPQ EFLQYTQPMK RDIKKAFYEM SLQAFNIFSQ HTFKYWKERH LKQIQIGLDQ

               130        140        150        160        170        180
              *   *      *   *      *   *      *   *      *   *      *   *
AF146759  QAEYLNQCLE EDENENEDMK EMKENEMKPS EARVPQLSSL ELRRYFHRID NFLKEKKYSD>
          |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L     QAEYLNQCLE EDENENEDMK EMKENEMKPS EARVPQLSSL ELRRYFHRID NFLKEKKYSD

               190        200
              *   *      *   *      *
AF146759  CAWEIVRVEI RRCLYYFYKF TALFRRK>
          |||||||||| |||||||||| |||||||
IFN-L     CAWEIVRVEI RRCLYYFYKF TALFRRK
```

EXHIBIT C

```
                  10         20         30         40         50         60
                *    *     *    *     *    *     *    *     *    *     *    *
XM_035950  MSTKPDMIQK CLWLEILMGI FIAGTLSLDC NLLNVHLRRV TWQNLRHLSS MSNSFPVECL>
           |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L      MSTKPDMIQK CLWLEILMGI FIAGTLSLDC NLLNVHLRRV TWQNLRHLSS MSNSFPVECL

                  70         80         90        100        110        120
                *    *     *    *     *    *     *    *     *    *     *    *
XM_035950  RENIAFELPQ EFLQYTQPMK RDIKKAFYEM SLQAFNIFSQ HTFKYWKERH LKQIQIGLDQ>
           |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L      RENIAFELPQ EFLQYTQPMK RDIKKAFYEM SLQAFNIFSQ HTFKYWKERH LKQIQIGLDQ

                 130        140        150        160        170        180
                *    *     *    *     *    *     *    *     *    *     *    *
XM_035950  QAEYLNQCLE EDkNENEDMK EMKENEMKPS EARVPQLSSL ELRRYFHRID NFLKEKKYSD>
           |||||||||| || ||||||| |||||||||| |||||||||| |||||||||| ||||||||||
I IFN-L    QAEYLNQCLE EDENENEDMK EMKENEMKPS EARVPQLSSL ELRRYFHRID NFLKEKKYSD

                 190        200
                *    *     *    *     *
XM_035950  CAWEIVRVEI RRCLYYFYKF TALFRRK>
           |||||||||| |||||||||| |||||||
IFN-L      CAWEIVRVEI RRCLYYFYKF TALFRRK
```

EXHIBIT D

```
                10         20         30         40         50         60
              *    *     *    *     *    *     *    *     *    *     *    *
AF38047                                mLDC NLLNVHLRRV TWQNLRHLSS MSNSFPVECL>
                                        ||| ||||||||||| |||||||||| ||||||||||
IFN-L     MSTKPDMIQK CLWLEILMGI FIAGTLSLDC NLLNVHLRRV TWQNLRHLSS MSNSFPVECL

                70         80         90        100        110        120
              *    *     *    *     *    *     *    *     *    *     *    *
AF38047   RENIAFELPQ EFLQYTQPMK RDIKKAFYEM SLQAFNIFSQ HTFKYWKERH LKQIQIGLDQ>
          |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L     RENIAFELPQ EFLQYTQPMK RDIKKAFYEM SLQAFNIFSQ HTFKYWKERH LKQIQIGLDQ

               130        140        150        160        170        180
              *    *     *    *     *    *     *    *     *    *     *    *
AF38047   QAEYLNQCLE EDENENEDMK EMKENEMKPS EARVPQLSSL ELRRYFHRID NFLKEKKYSD>
          |||||||||| |||||||||| |||||||||| |||||||||| |||||||||| ||||||||||
IFN-L     QAEYLNQCLE EDENENEDMK EMKENEMKPS EARVPQLSSL ELRRYFHRID NFLKEKKYSD

               190        200
              *    *     *    *     *
AF38047   CAWEIVRVEI RRCLYYFYKF TALFRR>
          |||||||||| |||||||||| ||||||
IFN-L     CAWEIVRVEI RRCLYYFYKF TALFRR
```